IN THE CLAIMS

1. (Currently Amended) A method, comprising:

processing at least one semiconductor device;

acquiring metrology data from said processed semiconductor device;

performing a field-to-field metrology analysis based upon said metrology data[[; and]] to determine a field-mean error;

determining a wafer-mean error;

comparing said field-mean error to said wafer-mean error;

performing residual-error analysis based upon said field-to-field analysis and said wafer-mean error, said residual-error analysis comprising determining whether a predetermined amount of residual error exists based upon said comparison of said wafer-mean error and said field-mean error data[[.]] ; and

performing at least one of a field-level adjustment and a wafer-level adjustment based upon said residual-error analysis.

2. (Original) The method described in claim 1, further comprising processing said semiconductor device in a subsequent manufacturing process based upon said residual-error analysis.

3. (Original) The method described in claim 1, wherein processing at least one semiconductor device further comprises processing semiconductor wafers.

4. (Original) The method described in claim 1, wherein acquiring metrology data from said processed semiconductor device further comprises acquiring field-to-field metrology data analysis.

5. (Original) The method described in claim 1, wherein performing the field-to-field metrology analysis comprises:

acquiring overlay error data from at least one exposure field on each processed wafer;

calculating overlay errors for said exposure field based upon said overlay error; and

generating a set of field-mean error data.

6. (Original) The method described in claim 5, wherein calculating overlay errors for said exposure field comprises calculating at least one misregistration error.

7. (Original) The method described in claim 5, wherein calculating overlay errors for said exposure field comprises calculating at least one misalignment error.

8. (Original) The method described in claim 5, wherein performing residual-error analysis comprises:

generating wafer-mean error data;

comparing said wafer-mean error data to said field-mean error to calculate a difference between said wafer-mean error and said field-mean error data;

determining whether a significant residual error exists based upon said comparison of said wafer-mean error and said field-mean error data; and

using said wafer-mean error to perform manufacturing adjustments in response to a determination that significant residual error does not exist.

9. (Original) The method described in claim 8, further comprising:

calculating at least one field compensation parameter for at least one wafer-level adjustment in response to a determination that significant residual error exists; and

performing at least one wafer-level adjustment to compensate for at least one field-level error.

10. (Original) The method described in claim 8, further comprising:

calculating at least one field compensation parameter for at least one field-level adjustment in response to a determination that significant residual error exists; and

performing at least one field-level adjustment to compensate for at least one field-level error.

11. (Currently Amended) A system, comprising:

a computer system;

a manufacturing model coupled with said computer system, said manufacturing model being capable of generating and modifying at least one control input parameter signal;

a machine interface coupled with said manufacturing model and said computer system, said machine interface being capable of receiving process data from said manufacturing model and said computer system;

a processing tool coupled with said machine interface, said processing tool being capable of receiving at least one control input parameter signal from said machine interface and performing a manufacturing process;

a metrology tool coupled with said processing tool, said metrology tool being capable of acquiring field-level metrology data; and

a metrology data processing unit coupled with said metrology tool and said processing tool, said metrology data processing unit being capable of organizing and analyzing said acquired field-level data and calculating at least one manufacturing error based upon a comparison of a field-mean error and a wafer-mean error for generating modification data.

12. (Original) The system of claim 11, wherein said computer system is capable of generating field-level compensation modification data based on said manufacturing error for modifying at least one manufacturing parameter.

13. (Original) The system of claim 12, wherein said manufacturing model is capable of modifying said manufacturing parameter in response to said field-level compensation modification data.

14. (Original) The system of claim 13, wherein said processing tool is further capable of performing field-level manufacturing process.

15. (Currently Amended) An apparatus, comprising:

means for processing at least one semiconductor device;

means for acquiring metrology data from said processed semiconductor device;

means for performing a field-to-field metrology analysis based upon said metrology data[[; and]] to determine a field-mean error;

means for determining a wafer-mean error;

means for comparing said field-mean error to said wafer-mean error;

means for performing residual-error analysis based upon said field-to-field analysis and said wafer-mean error, said means for performing said residual-error analysis comprising means for determining whether a predetermined amount of residual error exists based upon said comparison of said wafer-mean error and said field-mean error data[[.]]; and

means for performing at least one of a field-level adjustment and a wafer-level adjustment based upon said residual-error analysis.

16. (Currently Amended) A computer readable program storage device encoded with processing at least one semiconductor device;

acquiring metrology data from said processed semiconductor device;

performing a field-to-field metrology analysis based upon said metrology data[[; and]] to determine a field-mean error;

determining a wafer-mean error;

comparing said field-mean error to said wafer-mean error;

performing residual-error analysis based upon said field-to-field analysis and said wafer-mean error, said residual-error analysis comprising determining whether a predetermined amount of residual error exists based upon said comparison of said wafer-mean error and said field-mean error data[[.]] ; and

performing at least one of a field-level adjustment and a wafer-level adjustment based upon said residual-error analysis.

17. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 16, further comprising processing said semiconductor wafer in a subsequent manufacturing process based upon said residual-error analysis.

18. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 16, wherein processing at least one semiconductor device further comprises processing semiconductor wafers.

19. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 16, wherein acquiring metrology data from said processed semiconductor device further comprises acquiring field-to-field metrology data.

20. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 16, wherein performing the field-to-field metrology analysis comprises:

acquiring overlay error data from at least one exposure field on each processed wafer;

calculating overlay errors for said exposure field based upon said overlay error; and

generating a set of field-mean error data.

21. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein calculating overlay errors for said exposure field comprises calculating at least one misregistration error.

22. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein calculating overlay errors for said exposure field comprises calculating at least one misalignment error.

23. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein performing residual-error analysis comprises:

generating wafer-mean error data;

comparing said wafer-mean error data to said field-mean error to calculate a difference between said wafer-mean error and said field-mean error data;

determining whether a significant residual error exists based upon said comparison of said wafer-mean error and said field-mean error data; and

using said wafer-mean error to perform manufacturing adjustments in response to a determination that significant residual error does not exist.

24. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 23, further comprising:

calculating at least one field compensation parameter for at least one wafer-level adjustment in response to a determination that significant residual error exists; and

performing at least one wafer-level adjustment to compensate for at least one field-level error.

25. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 23, further comprising:

calculating at least one field compensation parameter for at least one field-level adjustment in response to a determination that significant residual error exists; and

performing at least one field-level adjustment to compensate for at least one field-level error.

26. (New) A system, comprising:

a processing tool to process at least one semiconductor device;

a metrology tool to acquire metrology data from said processed semiconductor device;

a controller to determine a field-mean error and a wafer-mean error based upon said metrology data and comparing said field-mean error and said wafer-mean error to determine whether a predetermined amount of residual error exists based upon said comparison of said wafer-mean error and said field-mean error data, the controller also being adapted to perform at least one of a field-level adjustment and a wafer-level adjustment based upon said residual error.

27. (New) The system of claim 26, wherein said semiconductor device is a semiconductor wafer.

28. (New) The system of claim 26, wherein said controller is adapted to control a processing operation upon a subsequent semiconductor device.

29. (New) An apparatus, comprising:

a controller to determine a field-mean error and a wafer-mean error based upon metrology data relating to a processed semiconductor device and comparing said field-mean error and said wafer-mean error to determine whether a predetermined amount of residual error exists based upon said comparison of said wafer-mean error and said field-mean error data, the controller also being adapted to perform at least

one of a field-level adjustment and a wafer-level adjustment based upon said residual error.

30. (New) The apparatus of claim 29, wherein said semiconductor device is a semiconductor wafer.

31. (New) The apparatus of claim 29, wherein said controller is operatively coupled with a processing tool to control an operation of said processing tool.

32. (New) The apparatus of claim 29, wherein said controller is capable of controlling a processing of a subsequent semiconductor device.

33. (New) The method of claim 1, wherein further comprising processing at least one additional semiconductor device.